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Cambridge, Massachusetts.

THE VALIDITY OF THE PENOBSCOT FIELD MOUSE

BY LELAND C. WYMAN

In December, 1901, Mr. Reginald Heber Howe, Jr., described a new subspecies of *Microtus pennsylvanicus* which he had collected on Tumble Down Dick Island in Penobscot Bay, Maine, naming it *Microtus pennsylvanicus shattucki*.¹ There has been some doubt among mammalogists as to whether or not this form really differs from the ordinary meadow mouse of the mainland. Following are the results of a careful comparison of the type specimen and other skins of *M. p. shattucki* with about two-hundred skins of *Microtus pennsylvanicus* (Ord) in the collections of the Lee Museum of Bowdoin College, the Museum of Comparative Zoology of Harvard University, and various private collections. The specimens of *M. p. shattucki* which were examined consisted of the type and seven others of the original series from Tumble Down Dick and Ilesboro, Maine, now in the museum at Harvard and in the collection of the Boston Society of Natural History. These are the only specimens from the type locality which could be located. Others may exist in private collections. The specimens of *Microtus pennsylvanicus* used in the comparison were collected from four localities in Maine; three islands of the Maine coast; Grand Manan Island, New Brunswick; one other locality in Canada; three localities in New Hampshire; eleven localities in Massachusetts; seven islands near Cape Cod, Massachusetts; two localities in Rhode Island; one locality

¹ A New Race of *Microtus pennsylvanicus*. Reginald Heber Howe, Jr. Proc. Portland Soc. Nat. Hist., vol. 2, part 6, p. 201. Portland, Maine, December 31, 1901.

in New York; one in West Virginia; one in North Carolina; and (three topotypes) in Pennsylvania.²

The subspecific characters given in the description are: "One of the largest of the *Microtus pennsylvanicus* group. Tail very long, ears prominent, bullæ very large and globular, palatine foramina markedly broad and bottle shaped, coloration as in *M. p. pennsylvanicus*, except perhaps slightly darker." I shall take up these characters one by one.

SIZE

The description gives the total length of the new subspecies as ranging from 176 to 198 mm., and that of *M. pennsylvanicus* from 167 to 171 mm. (taking these measurements from Elliot's "Mammals of North America"). Although this is the average range of the length of the meadow mouse it is not uncommon to find specimens measuring from 170 to 200 mm. Of the measurements of the specimens examined, 11.3 per cent of the whole number were between 190 and 200 mm., 20 per cent were between 180 and 190 mm., and 28.8 per cent were between 170 and 180 mm. The remaining 40 per cent were below 170 mm. Two specimens from Massachusetts and one from Raleigh, North Carolina, were over 200 mm. in length. The total lengths of the eight specimens of *M. p. shattucki*, taken from Howe's measurements, were 138.4 mm. (2), 165.1 mm. (2), 168.1 mm., 187.5 mm., 190.5 mm. (type), and 201.5 mm. With the exception of two specimens these measurements are well within the average range for *pennsylvanicus*. Meadow mice from the islands off the New England coast are large as a rule. The series from Grand Manan, New Brunswick, which I examined were at the upper limit for the size of the species.

EARS

It is difficult to tell much about the ears of dried skins, owing to their shrunken condition. Those of the skins of *M. p. shattucki* did not appear to be any different from those of skins of meadow mice from a great variety of localities. Five of the specimens were collected in July, one in August, and one in September. In summer pelage the ears of meadow mice are usually conspicuous above the fur, so this fact may account for the statement that the ears are prominent. Such a char-

² I am indebted to Prof. Manton Copeland of Bowdoin College for suggesting the comparison and to Dr. Glover M. Allen of Harvard University for the loan of skins and skulls.

acter should not bear much weight in an animal as variable in minor details as the meadow mouse.

COLORATION

The color of the meadow mouse is due to a mixture of yellowish rusty and blackish hairs, the relative abundance of which determines the particular shade. In a large series of meadow mice there is a great variety of fine gradations of color from very pale, yellowish specimens to those which are dark brown or blackish. Many from the mainland of New England are almost black in color. The series of *M. p. shattucki*, when compared with a series of three hundred skins from a great variety of localities, were seen to be in about the middle of the range of color variation. They are rather bright with a large proportion of yellow and reddish hairs, being almost identical in color with specimens from various localities in Massachusetts, and distinctly lighter than many others also from Massachusetts.

AUDITAL BULLÆ

Upon superficial examination there appears to be no noticeable difference between the bullæ of the skulls from Tumble Down Dick and of those collected in various places in New England. A skull from Wareham, Massachusetts, was seen to be almost an exact match in every particular for the skull of the type specimen of *M. p. shattucki*. The skulls of the series from Grand Manan are comparatively large and heavy and the bullæ are large in proportion, appearing to be more globular than those of *shattucki*. For purposes of comparison the greatest length and the greatest width of the right bullæ of the seven skulls of *shattucki* and of ninety-six skulls of *pennsylvanicus* were measured to the nearest hundredth of a millimeter by means of calipers and a micrometer. The dimensions of the bullæ of *shattucki* ranged from 7.32 by 5.75 to 8.85 by 6.63 mm. Those of *pennsylvanicus* run up to 9.41 by 7.00 mm. The average dimensions of the right bullæ of fifteen specimens from Grand Manan is 8.53 by 6.43 mm. In order to obtain a quantitative expression of the globularity of the bullæ, the width was subtracted from the length in each case, and the result was divided by the length. This gave an index of the ovalness of the bulla which would be smaller in the case of more globular and larger in the case of less globular bullæ. The indices thus obtained were grouped into nine magnitude classes and the classes were numbered in order. Class

4 contained the greatest number of variates, thus being the mode. The indices of three of the specimens of *shattucki* fall into this class, three into class 5 and one falls into class 6. This constitutes quantitative proof that the audital bullæ of *M. p. shattucki* are not more globular than the average bullæ of *M. pennsylvanicus*.

PALATINE FORAMINA

The palatine foramina of meadow mice vary greatly in size and shape. Many are seen in skulls collected from various places which appear to be as broad as or broader than those of *M. p. shattucki*, especially in large skulls such as those of the Grand Manan series. The length and greatest width of the palatine foramina of eight skulls of *shattucki* and of 103 skulls of *pennsylvanicus* were measured with calipers. The dimensions of those of *shattucki* range from 4.57 by 1.35 to 6.10 by 1.56 mm. The width of the foramina of *pennsylvanicus* run up to 1.79 mm. The average dimensions of the Grand Manan series are 5.89 by 1.52 mm. The expression "bottle shaped" is an obscure one to deal with quantitatively. This character may best be expressed as an index by dividing the length by the greatest width, giving a number which would be smaller in the case of more bottle shaped foramina. This was done for each specimen measured and the results were grouped into eleven magnitude classes, class 5 constituting the mode. Of the indices of *M. p. shattucki*, three fall into the mode, three into class 6 and one each into classes 3 and 4, proving quantitatively that the palatine foramina of *shattucki* are not broader in proportion to their length than the average foramina of meadow mice, and hence cannot be considered more bottle shaped.

TAIL LENGTH

The tail length of the new subspecies is described as ranging from 54 to 62 mm., while the average range of tail length of meadow mice is given as from 44 to 46 mm. The recorded measurements, taken in the flesh, of 186 specimens of meadow mice range from 30 to 60 mm. The tail lengths given in the records with the skins of *M. p. shattucki* fall well within this range with the exception of two specimens, both of which are recorded as 63.5 mm. It is not uncommon to find meadow mice with tail length well up to 60 mm., and where only two specimens range slightly above this, it seems hardly plausible to base a subspecies on such a character. There is a possibility, also, that the records on

the labels are not correct. The tails of the skins of *shattucki* were measured with calipers and found to be from 6.1 to 17.8 mm. shorter than the recorded measurements. Of course it is impossible to say anything about the dimensions of an animal in the flesh from measurements of the dried skin, but as a rule the technique of skinning causes the tail to be stretched if anything. To test this the tails of 80 skins made up by a number of different collectors were measured and compared with the measurements of the same animals taken in the flesh. In 50 per cent of the cases the tails were from 0.5 to 13 mm. longer than the lengths recorded and in 12 per cent they were the same. It does not seem probable that the tails of the *shattucki* series would have shrunk so consistently.

CONCLUSION

The comparison described above showed no essential differences between the Penobscot field mouse and the common meadow mouse of the mainland. In all of the characters mentioned in the description as being subspecific, the specimens of the *shattucki* series lie within the range for *Microtus pennsylvanicus*. In view of the constantly increasing complexity of the classification of mammals it would seem well to exclude the subspecies *shattucki* from a revised list of species in the genus *Microtus*.

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